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ABSTRACT

Four combinations of teacher verbal and nonverbal evaluative behavior were studied within a controlled microlesson. Two male and two female teachers presented each of the four combinations--(a) verbally and nonverbally positive; (b) verbally positive and nonverbally negative; (c) verbally negative and nonverbally positive; or (d) verbally and nonverbally negative--to different, randomly selected samples of sixth-grade male and female subjects. Data analysis indicated that negative teacher nonverbal behavior led to significantly greater performance during the lesson. Teacher verbal behavior also influenced subject performance, interacting with the factor of individual teacher. On the measure of learning, females achieved significantly higher scores and teacher sex interacted with student sex. (Author)

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The Impact of Teacher Nonverbal Behavior upon Student Learning and Performance

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Student Learning and Performance Under Varying Conditions of Teacher Verbal and Nonverbal Evaluative Communication

Previous well-controlled investigation of the effects of teacher behavior upon student learning and performance has failed to examine nonverbal dimensions of teacher communications. Researchers have assumed that the salient features of teacher-student interactions are to be uncovered through an analysis of verbal communication (Galloway, Note 1). Though many educators have speculated about the significance and influence of nonverbal behavior, little research existed to document its impact.

The present study sought to answer the following questions within a well-controlled classroom analog setting:

1. Do teacher evaluative verbal statements directed to a group of students affect student performance and learning on a task?
2. Do teacher nonverbal communications affect student learning and performance on the same task?
3. Do either student gender or teacher gender mediate the influence of teacher evaluative behavior upon student performance or learning?

Several studies have found that positive verbal evaluations from the teacher is related to student achievement. These positive statements may be such comments as "good" or "thank you" following student comments (Wright & Nuthall, 1970), or teacher praise of student responses (O'Leary & O'Leary, 1976; Hughes, 1973). According to Rosenshine (1976) the impact of teacher

criticism of student responses on achievement has been inconsistent. Some investigators have found that teacher criticism following incorrect student answers is positively related to achievement (Stallings and Kaskowitz, Note 2). Others have found negative correlations between teacher criticism and student achievement (Brophy and Evertson, 1974). Reed, Morris, and Martin (1975) found that reprimands were more effective than praise in controlling child on-task behavior in a non-classroom setting.

The influence of teacher nonverbal behavior on student achievement and performance is much less clearly defined than the role of verbal behavior. Several studies have demonstrated that adults, in the role of tutors, present different nonverbal messages to tutees, depending upon some characteristic of the tutee such as I.Q. (Chaikin, Sigler, & Derlega, 1974), or race (Feldman, Note 3). Chaikin et al. found, for example, that tutors evidenced more smiles, affirmative head nods, forward body lean, and eye contact when they believed their tutee was "bright" as opposed to being led to believe he was "dull." These researchers recommend that the impact on students of this differential nonverbal treatment be studied systematically.

One attempt to study the <u>effects</u> of teacher nonverbal behavior used a videotaped teacher. Middleman (1972) found that black lower socioeconomic children were more productive on one of three tasks administered when the nonverbal behavior of the teacher was negative. No difference was found on any task for white children. It is difficult to generalize from this study, however, since the students had no reason to believe the teacher's behavior was

directed toward them personally. In an attempt to study response to teacher nonverbal behaviors in a setting which would supply increased external validity, Woolfolk and Woolfolk (1974) examined the effects on students of teacher evaluative behavior during an experimental microlesson. Subjects were taught by a female instructor whose behavior was programmed to allow the verbal and nonverbal inputs of teacher communication to be systematically varied across conditions. Both verbal and nonverbal behavior were found to affect subjects' perception of the teacher and attraction for her, but verbal behavior had the greater impact on students' responses.

While the goal of increased external validity was achieved using the Woolfolk and Woolfolk paradigm, several issues were not explored in the initial study. Specifically the influence of teacher verbal and nonverbal communications on student learning was not explored. The present study utilized the microlesson format developed by Woolfolk and Woolfolk, (1974) to investigate teacher gender and student gender as mediators of the effects of verbal and selected nonverbal components of teacher evaluative communications upon student performance and learning.

The nonverbal behaviors examined in this study were facial pleasantness (smile), affirmative head nod, and tone of voice (more accurately called a paralinguistic behavior). The rationale for studying these and no other nonverbal behaviors is described fully in Woolfolk, Woolfolk and Garlinsky (in press). Briefly, facial pleasantness and head nod have been found to communicate liking and positive evaluation of a recipient (Mehrabian, 1972). Other nonverbal behaviors included by Mehrabian in this <u>evaluative</u> dimension

of nonverbal communication were excluded from the present study because they could not be systematically manipulated within the limitations of the microlesson task or because they had been found in previous research to convey different meanings when emitted by female versus male communicators. Voice tone was included because it is a necessary concomitant of spoken communications.

A frequent finding in research on the communication of messages via the nonverbal channels is that the sex of the recipient and the communicator affects the decoding of the message sent. Rosenthal, Archer, DiMatteo, Koivumaki, and Rogers (Note 4) reviewed 43 independent studies of adult and child decoding of nonverbal cues. In 77% of the studies females were superior in accurately judging messages communicated by facial expression, body movement, or voice tone. Sex of communicator has also been shown to affect the decoding of inconsistent adult messages by children. Bugental, Kaswan, and Love (1970) found that positive messages were discounted in the communications of female speakers if any of the components of the message (verbal, facial, or vocal) were negative. This discounting did not occur for male communicators.

The following hypotheses were developed, based upon the findings described above in the areas of teacher praise and criticism, teacher nonverbal behavior, and the effects of sex of communicator and recipient upon the decoding of a nonverbal message. It was predicted that positive verbal statements and positive nonverbal communications would lead to increased performance and learning. Second, it was hypothesized that female students would be more sensitive than male students to teacher nonverbal behavior.

Specifically, it was predicted that student sex would interact with teacher nonverbal behavior such that the responses of female students to positive teacher nonverbal behavior would be more positive than the responses of male students and more negative than male students to teacher negative nonverbal behavior.

Method

Subjects

One hundred and twenty eight students randomly selected from the entire sixth grade class of a suburban middle school in New Jersey served as subjects. The school serves a predominantly middle-class area near a large state University. After losing two subjects due to illness, the final sample consisted of 62 females and 64 males.

Experimenters and Teachers

Experimenters in the present study were 5 graduate students in psychology (three females and two males). Experimenters were randomly assigned to conditions and teachers.

Two male and two female undergraduate students in teacher education served as teachers in the study. They were blind to both the dependent variables and the hypotheses being investigated, and were paid for their participation in the study.

Design

Four combinations of verbal and nonverbal evaluative communication were presented by each of the four teachers. Thus there were 16 cells. Subjects were randomly assigned within gender groups to the 16 cells such that each cell contained four males

and four females. (Subjects absenses and schedule changes on the days of the study caused some cells to vary from this balance of males and females.) Teachers were randomly assigned to cells within each of the four combinations of teacher evaluative communication.

The experiment utilized a 2 x 2 x 2 x 2 partially nested factorial design. The factors of teacher sex, student sex, teacher verbal evaluative communication and teacher nonverbal evaluative communication were all at two levels and crossed. The individual teacher factor was nested within teacher sex.

Microlesson Task

The experimental manipulation of teacher verbal and nonverbal evaluation communications was embedded within a vocabulary lesson. The English teachers in the subjects' school identified sixteen words they believed were unknown to a majority of the 6th grade students. The eight words used in the vocabulary lesson were randomly chosen from this list of 16 words. The subjects' task during the microlesson was to write as many sentences as possible using the words, then recall the correct spelling and definition of each word when tested.

Procedures

During the two weeks prior to the study the four teachers received 15 hours of training in the presentation of both positive and negative evaluation via the verbal and nonverbal channels. In order to check the effectiveness of training, a videotape was prepared on which each teacher demonstrated two randomly selected statements from each experimental condition plus two neutral statements. These statements were audiotaped and videotaped during a

simulated teaching situation in which six adults played the role of students.

Several different checks were completed on the teachers' presentation of nonverbal messages. Five independent judges rated the videotape without sound on a 13-point scale (+6 indicating friendly, warm, approving and -6 indicating unfriendly, cold, disapproving). Second, the voice tone of the messages was rated by another group of judges using the same 13-point scale. The audiotape was passed through a band-pass filter to mask speech content for this check. Mean ratings for voice tone and picture without sound are presented in Table 1. A factorial analysis of variance conducted on the ratings showed no significant main effect or interaction involving teacher sex, individual teacher, or individual rater. The evaluative content of the verbal statements was determined by a third group of five raters. On the same 13-point scale a mean rating was found of +3.73 (SE_m = .16) for the positive statements and -3.63 for the negative statements (SE_m = .17).

Insert Table 1 about here

The experiment was conducted in the subjects' school on eight consecutive school days during the late morning. In each cell subjects were brought by an experimenter from their study hall to a vacant classroom. After being seated, the subjects were told by the experimenter that they were going to participate in a vocabulary lesson, the purpose of which was to investigate how students learn. The students were also informed that because an

important purpose of the lesson was to "find out how kids learn without asking any questions at all," they would be prohibited from asking questions during the lesson. In this manner teacher communication, other than that which was experimentally manipulated, was controlled.

The experimenter then introduced the teacher. The various teachers wore clothing of equivalent formality, in keeping with the norm for the regular teachers in the school. Male teachers were introduced as Mr. Ross and female teachers as Miss Lee. No other information about the teacher was given.

In every condition the teacher stood in front of the subjects, pronounced the first vocabulary word, and displayed an 18" x 14" card showing the word printed. She/he then spelled the word and used it in two example sentences. After presenting the vocabulary word the teacher instructed the subjects to write as many "interesting and original sentences" as possible in two minutes using the word. During this two minute writing period the teacher walked around the room ostensibly examining the students' work. All teacher behaviors during the presentation of the word and the sentence-writing period were neutral.

Immediately after each two minute work session and before the presentation of the next vocabulary word the teacher rendered a two-sentence evaluation of the subjects' work. The varying of these evaluations across conditions was the experimental manipulation. In Condition I the teacher's positive verbal statements to the subjects (e.g., "You're writing very interesting sentences. This must be a smart class.") were accompanied by the positive nonverbal communications of pleasant voice tone, head nod, and smiling

face. In Condition II the same positive verbal statements were accompanied by negative nonverbal behaviors of angry voice tone, horizontal movement of head, and frowning face. In Condition III the teacher gave negative verbal evaluations (e.g. "You're not writing very interesting sentences. This must not be a smart class.") accompanied by the positive nonverbal elements of pleasant voice tone, etc. Condition IV contained only negative verbal statements and negative nonverbal communications.

The sequence of neutral presentation of a vocabulary word, two minute sentence writing period, and teacher evaluation was repeated eight times. Thus in each condition the subjects received eight, two-sentence evaluations from the teacher.

In every condition, following the last evaluation, the teacher left the room, the experimenter administered the spelling posttest and collected the sentences written by the subjects.

Dependent Measures

Performance during the lesson was assessed by determining the total number of sentences written by each subject in the eight two-minute sentence writing periods. The number of sentences written by each subject was considered his or her performance score. The difference between the subjects' pre- and posttest spelling scores was the learning score for each subject.

Results

Performance

A five-way analysis of variance (Verbal Behavior x Nonverbal Behavior x Teacher Gender x Student Gender x Individual Teacher nested within Teacher Gender) was conducted on the performance

scores. The first four factors were treated as fixed effects. The fifth factor was treated as a random effect. Mean performance score for subjects in each condition are presented in Table 2.

A significant main effect on performance was found for nonverbal behavior, $F(1,2) = 25.83$, $p < .04$. Students experiencing negative teacher nonverbal behavior wrote significantly more sentences than students in the positive nonverbal conditions, (a mean of 27.7 sentences in the negative condition compared with 22.5 in the positive condition). A significant interaction involving verbal communications and individual teacher was found, $F(2,9) = 5.69$, $p < .006$. For three of the teachers, positive verbal statements were associated with greater performance than negative verbal statements. The effect of positive and negative verbal statements was reversed for the fourth teacher. This interaction is shown in Figure 1. Using Tukey's procedure for making multiple comparisons among means (Kirk, 1968) the difference between the mean performance scores in the positive and negative verbal condition for each teacher was found to be significant at the .05 level. Thus for three teachers positive verbal statements led to significantly greater student performance, while negative verbal statements led to significantly greater student performance for the fourth teacher (a female).

Learning

The five way analysis of variance described above was conducted on the pretest spelling scores. No significant Verbal x Nonverbal x Individual Teacher interaction was found. Thus it was assumed that the subjects in the 16 cells were initially comparable in ability to spell the eight vocabulary words used in the study.

Insert Table 2 and Figure 1 about here

The same five way analysis of variance was conducted on the learning scores. (Mean learning scores for subjects in each condition are presented in Table 3). A significant main effect was found for student gender, $F(1,2) = 18.19$, $p < .05$. Females proved to be better students of spelling, improving more by the end of the lesson. The mean learning score for females was 3.1, while the mean for males was 2.8. As depicted in Figure 2, a significant Teacher Sex x Student Sex interaction was found, $F(1,2) = 23.38$, $p < .04$. The best combination (in terms of student learning) was female teacher with female student. The worst combination was female teacher and male student. The mean scores of both male and female students working with male teachers were similar and between the two extreme means described above. In addition to these two significant effects, there was a trend noted. Teacher nonverbal behavior tended to affect female students more strongly than male students, $F(1,2) = 8.09$, $p < .10$. The spelling scores of male students appeared unaffected by teacher nonverbal behavior, whereas females made greater gains when teachers were nonverbally negative.

Tukey's technique for making multiple comparisons among means was used to identify significant differences among the means in the Teacher Sex x Student Sex interaction. The mean learning score of male students working with female teachers was significantly lower than the mean score of both female students working with female teachers and male students working with male teachers. However, the mean learning score of male students working with female teachers did not differ significantly from the mean learning score of female students working with male teachers. Male teachers were no more successful with male than with female students. But

female students learned significantly more with female than with male teachers.

Insert Table 3 and Figure 2 about here

Discussion

Perhaps the advice, "Don't smile until Christmas" has received empirical support in this investigation. Student performance rate was significantly higher for teachers who were nonverbally negative, regardless of the sex of the teacher or the sex of the student. This finding is not congruent with Middleman's (1972) results indicating that nonverbal behavior of a videotaped teacher did not affect the performance of the white middleclass children in her sample. Those children were similar in age and background to the students in the present study.

The finding that negative nonverbal behavior is more effective in increasing student performance is more in keeping with the results of Redd et al. (1975). Subjects in the above study worked harder for a negative adult than for a positive or neutral adult. However, in the Redd et al. study, only verbal behavior was manipulated systematically. Smiles, in the positive condition, and presumably frowns in the negative condition accompanied the verbal statements. The effect of nonverbal behavior was not examined separately from verbal behavior.

In the present study, Condition I (positive verbal-positive nonverbal) and Condition IV (negative verbal-negative nonverbal) most closely approximate the positive and negative conditions re-

spectively in the Redd et al. study. Yet, in the present study, the mean performance scores for subjects in those conditions were almost identical.

The actual difference accounting for the main effect for nonverbal behavior was between Conditions II and III (see Table 2). Positive words accompanied by negative nonverbal behavior was the most effective combination, while negative words accompanied by positive nonverbal behavior was the least effective. Perhaps the combination of verbal and nonverbal behavior presented in Condition II represents the operationalizing of the "firm but fair" teacher. The words are supportive but the nonverbal behavior communicates seriousness and control. It is possible that the teacher whose words are negative, but nonverbal behaviors are positive is seen as timid, anxious, fearful, not confident, or unassertive, and, therefore, not to be taken seriously.

A recent study by Bugental, Henker, and Whalen (1976) provides some support for the above explanation of the ineffectiveness of negative words coupled with positive nonverbal behavior. These researchers found that individuals who expect to be ineffective sources of influence interpersonally communicate this expectation by saying assertive statements in an unassertive voice tone. On the other hand, individuals who perceive themselves as effective sources of influence speak with an assertive voice tone while usually saying less assertive statements. It is possible that saying, "These are not very good sentences" in a warm friendly voice tone while smiling (Condition III) communicates an apology for being critical or an expectation that the "assertive" verbal criticism will have little influence on students.

If Conditions II and III in this study approximate low verbal assertive-high vocal assertive and high verbal assertive-low vocal assertive conditions respectively, then the results of this study are similar to those of Bugental and Love (1975). These investigators found that parents who were ineffective in controlling their childrens' behavior were characterized by high verbal assertiveness accompanied by low-assertive voice tone. The audiotape used in this study is currently being rated using the Bugental et al. (1976) method for measuring vocal assertiveness.

Neither teacher verbal statements nor teacher nonverbal behavior had a significant effect on student learning. A trend was noted, however, for nonverbal behavior. Females made greater gains in spelling when the teacher, regardless of sex, was nonverbally negative. Thus the hypothesis that female subjects would be more sensitive than male subjects to teacher nonverbal behavior was partially confirmed. Other factors influencing student learning were the gender of teacher and student. Female students were better students of spelling. This is not surprising since girls tend to excell in verbal skills during the age range of the subjects in the present study. The Teacher Sex x Student Sex interaction could be interpreted as meaning that female teachers are more effective with female than with male students in the sixth grade, at least when teaching a verbal skill. These results are not in keeping with results of other studies examining the effects of teacher sex on student achievement (eg. Bennett, 1967; Peterson, 1972). These researchers were primarily interested in determining

whether the presence of male teachers would lead to greater achievement for male students. Although male students did learn more in the present study with male as opposed to female teachers, this conclusion has not been unanimously supported by other research (Brophy and Good, 1974). The difference found in this study, though significant at the .05 level, was not large. Male students working with male teachers had a mean learning score of 2.875, whereas male students working with female teachers had a mean of 2.636.

Some studies have found that student achievement is greater when the teacher is female (Bennett, 1967; Lahaderne and Cohen, Note 5). The advantage of female teachers was true only for female students in this study. Students learned best, in the situation studied, with same-sex teachers.

The findings from this study taken with the results of our earlier investigations using the same paradigm (Woolfolk, Woolfolk and Garlinsky, Note 6; Woolfolk, Garlinsky, and Nicolich, in press) indicate that differences in teacher nonverbal behaviors are perceived by students and influence student liking for the teacher, willingness to self-disclose to the teacher, and performance on a task supervised by the teacher. Future research should examine the relationship between the nonverbal assertiveness of teachers and the teachers' effectiveness in influencing students.

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Footnotes

[1]The author wishes to express her thanks to Mark Nicolich for his assistance with the analysis of data and to Karen Garlinsky for her help in carrying out this experiment.

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Table 1

Judgments of Nonverbal Teacher Behaviors

Nonverbal behaviors	TEACHER SEX			
	Female		Male	
	x	SE_M	x	SE_M
Positive picture	3.9	.38	3.7	.34
Negative picture	-3.8	.25	-4.1	.38
Neutral picture	0.3	.34	-0.1	.48
Positive voice tone	3.3	.30	2.9	.28
Negative voice tone	-3.6	.31	-3.4	.31
Neutral voice tone	0.3	.34	-0.2	.36

Table 2

Mean Performance Scores by Condition

	Conditions	Scores
I	Verbal + Nonverbal +	25.6
II	Verbal + Nonverbal -	29.4
III	Verbal - Nonverbal +	19.0
IV	Verbal - Nonverbal -	25.8

Table 3

Mean Learning Score by Condition

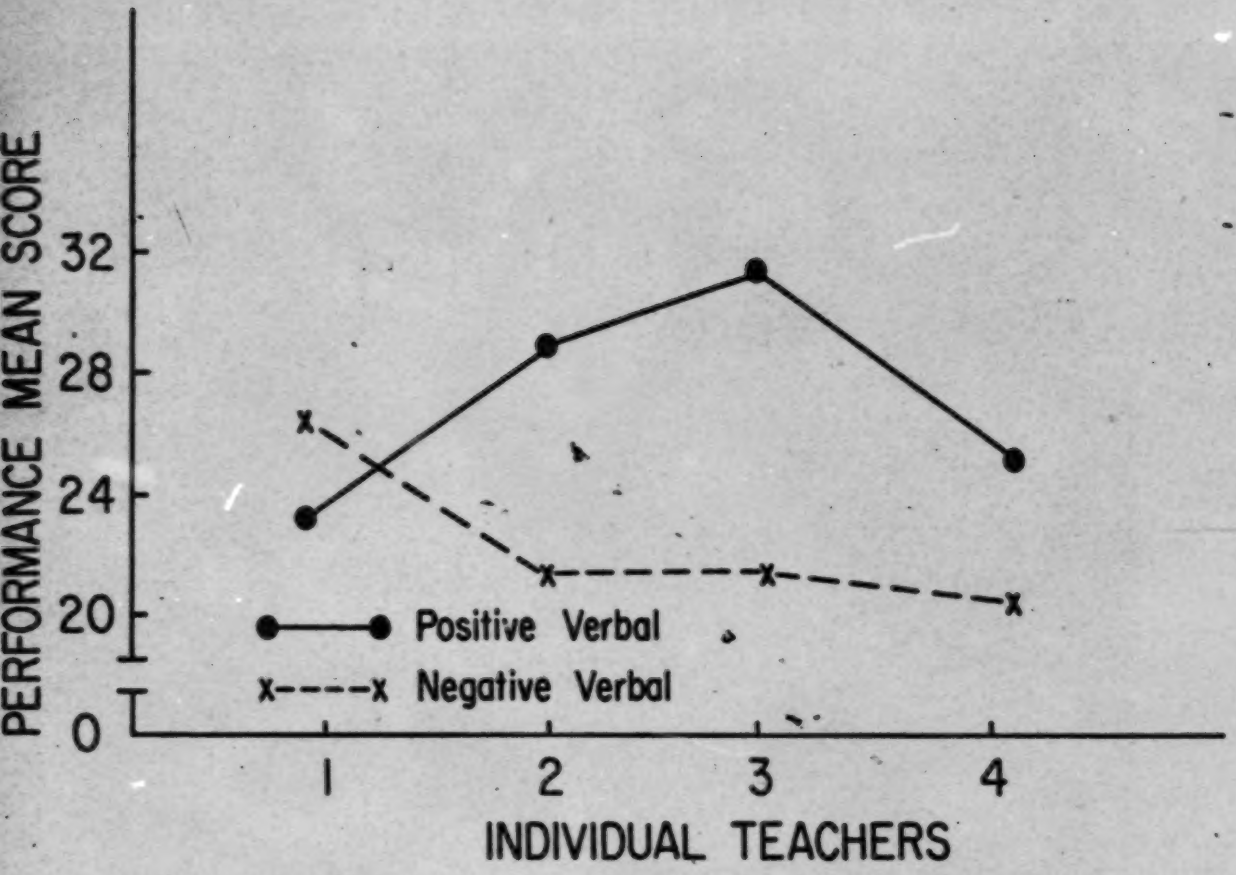
	Conditions	Scores
I	Verbal + Nonverbal +	2.7
II	Verbal + Nonverbal -	3.2
III	Verbal - Nonverbal +	2.7
IV	Verbal - Nonverbal -	3.0

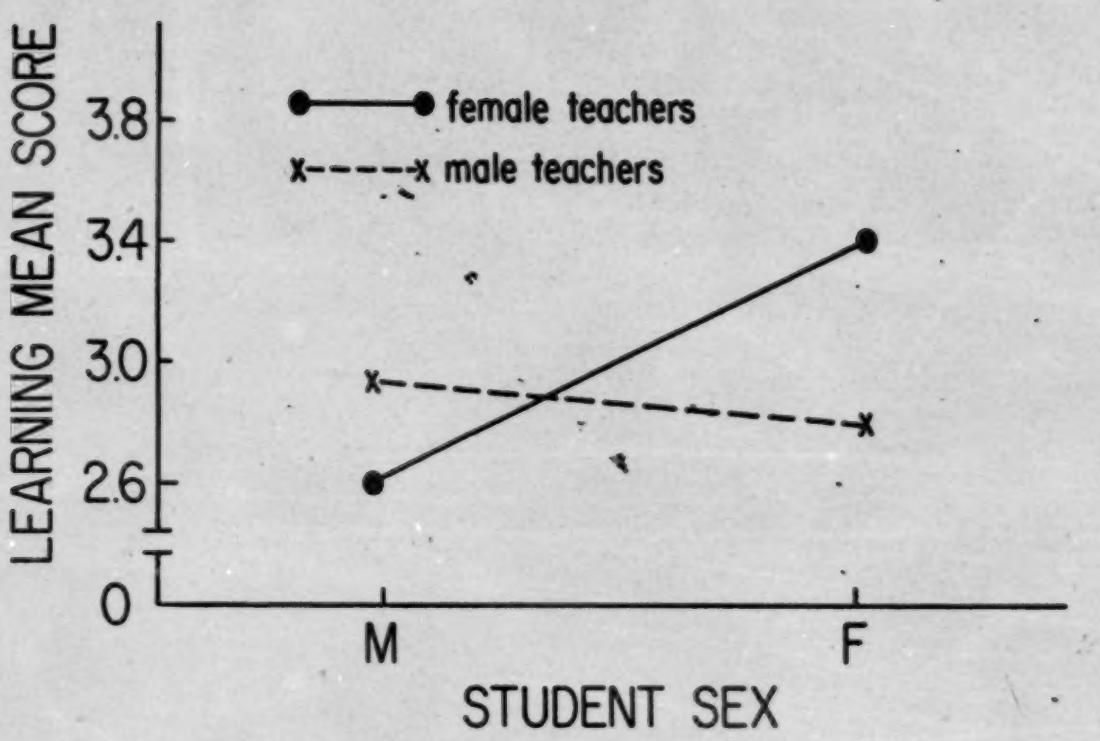
Note: Maximum score = 8

Figure Captions

Figure 1. Mean Performance scores by individual teacher and by levels of verbal behavior.

Figure 2. Mean learning scores by sex of student and by sex of teacher.


PERFORMANCE MEAN SCORE
32
28
24
20
0
Positive Verbal
Negative Verbal
1
2
3
4
INDIVIDUAL TEACHERS


LEARNING MEAN SCORE
3.8
3.4
3.0
2.6
0
female teachers
male teachers
M
F
STUDENT SEX